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09/870,389

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Sascha Bohnenkamp

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27317

7590

04/08/2004

FLEIT KAIN GIBBONS GUTMAN & BONGINI  
COURVOISIER CENTRE II, SUITE 404  
601 BRICKELL KEY DRIVE  
MIAMI, FL 33131

EXAMINER

EDWARDS, PATRICK L

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 04/08/2004

5

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/870,389

Applicant(s)

BOHNENKAMP, SASCHA

Examiner

Patrick L Edwards

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Specification*

1. The disclosure is objected to because of the following informalities:
  - a) The attempt to incorporate subject matter into this application by reference (paragraphs [0002-0003] and [0023] is improper because the serial numbers of the incorporated applications are not listed.Appropriate correction is required.

### *Claim Rejections - 35 USC § 112*

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
3. Claims 1-9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Referring to claim 1, the metes and bounds of the term 'reference', as recited in the claim, are not clear. Additionally, the specification fails to provide support or a clear definition for this term.

Referring to claim 2, the term 'cases' lacks antecedent basis.

Additionally referring to claim 2, the third file described in part (f) of the claim appears to be redundant in view of the the first file from part (a) of claim 1. The third file is said to describe a sequence of images required for the processing of each individual case (which are part of a workflow (see part (e)). Consequently, the third file seems to be describing a sequence of images required for carrying out a predetermined workflow. This is exactly what the first file from part(a) is doing. As a result, it appears as if the third file from part (f) and the first file from part (a) are describing the same thing.

Referring to claim 14, the metes and bounds of the term 'reference' as recited in the claim are not clear. Additionally, the specification fails to provide support or even a clear definition for this term.

Further referring to claim 14, the term 'reference' lacks antecedent basis.

Further referring to claim 14, the term 'priority' lacks antecedent basis.

Further referring to claim 14, the term 'lock count' lacks antecedent basis.

Further referring to claim 14, the term 'requestor' lacks antecedent basis.

Referring to claim 17, the term 'request' lacks antecedent basis.

Referring to claim 21, the metes and bounds of the phrase 'an image format for selection of a data source' are not clear. It isn't clear how an image format can be used in the selection of a data source. What exactly are the terms 'data source' and 'image format' referring to as used in this particular context.

### *Claim Rejections - 35 USC § 102*

Art Unit: 2621

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Form (EP 0 766 183 A1).

Referring to claim 1, Form discloses providing a first file descriptive of a sequence of images required for carrying out a predetermined workflow, the first file comprising a reference for each of the images (page 6 lines 37-44). Form discloses an electronic document (a file) containing frame semantic hints. Frame semantic hints are rankings used to determine the sequence of frames (images) to be displayed in a given page (page 6 lines 47 – page 7 line 12). The semantic hints (which are contained in a first file), refer to (are a reference for) each of the images.

With regard to part (b) of claim 1, Form discloses a technique called ‘resource tagging’, which maps elements of a document (such as frames in a given page) to particular resources within the system (i.e. the system storage (page 5 lines 32-40)). Inherent in the process of mapping the frames (images) to the system resources is the technique of accessing a current frame in memory on the basis of its memory location. As a result, Form inherently discloses providing a first pointer for pointing to a current image of the sequence of images.

Form further discloses reading the reference of at least one subsequent image of the sequence of images which is subsequent to the current image in the workflow, and prefetching the subsequent image by means of its corresponding reference (page 7 lines 9-15). Again, the semantic hints disclosed in Form (which are read to determine which image is prefetched) are a reference for each of the images.

Referring to claim 2, Form discloses providing a second file descriptive of a number of cases to be sequentially processed in the workflow (page 6 lines 37-44). Form discloses an electronic document (a file) containing page semantic hints. Page semantic hints describe whole pages in order to determine which pages are sequentially processed. The pages disclosed in Form are analogous to cases as recited in the claim in that both are used to organize individual images.

Form further discloses a third file which describes a sequence of images required for the processing of each individual case (page 6 lines 45 – page 7 line 15). The frame semantic hints (which are contained in a file), describe a sequence of frames (images) required for the processing of an individual page (case).

Referring to claim 3, Form discloses a system in which the current page (or case) has been mapped from memory to cache. The use of a pointer is inherent in this process in that a memory location must be known in order

Art Unit: 2621

to retrieve the data from memory. As a result, Form inherently discloses providing a pointer which points to a current case of the number of cases to be sequentially processed.

Referring to claim 4, Form discloses that the first file comprises first data descriptive of an image format (page 6 line 46 – page 7 line 7).

Referring to claim 5, Form discloses that the first file comprises data descriptive of an image processing operation (page 6 line 46 – page 7 line 28). The frame semantic hints disclosed in Form determine where each frame is positioned and whether the frame is displayed in actual format or fallback format. Both the positioning of the image and the display mode of the image qualify as image processing operations as recited in the claim.

Referring to claim 6, Form further discloses assigning a priority to the subsequent image when prefetching is performed (page 6 lines 20-22). The rating of visual importance as disclosed in Form is analogous to assigning a priority as recited in the claim.

Referring to claim 7, Form discloses caching prefetched images in an image cache (page 7 lines 18-19). Form further discloses removing prefetched images from the image cache by a least recently used algorithm (page 9 line 39 – page 10 line 20 in conjunction with Figures 8a-c). A least recently used algorithm is an algorithm which replaces the data in the cache which has gone the longest without being used. Form discloses this situation in Figures 8a-c and the accompanying description. In Figure 8a, the data corresponding to page 5 is the data in the cache which has gone the longest without being used. In Figure 8c, we see that this is the data which gets removed from the cache. As a result, the algorithm disclosed in Form for removing prefetched images from cache qualifies as a least recently used algorithm as recited in the claim.

Referring to claim 8, Form discloses generating an image header for storage in a cache when the prefetching is performed (page 7 lines 44-47). The description object associated with a frame as disclosed in Form is analogous to an image header as recited in the claim. It follows that the image headers are stored in the cache when their corresponding images are prefetched.

Referring to claim 9, Form further discloses that the description object (or image header) contains data descriptive of the required image format, an image processing operating, the priority of the image and lock count for locking the image in the cache (page 7 line 38 – page 8 line 54). Form discloses that the image header contains semantic hints, which describe the image format such as text, picture or graphics. Form further discloses that the image header contains information describing the frame's layout information, which qualifies as image processing as recited in the claim. Form further discloses that the image header contains information describing the priority of the image (page 8 lines 47-50). Form further discloses that the image header contains information describing a lock count for locking the image in the cache (page 8 lines 14-18). The 'locked' tag disclosed in Form is analogous to the lock count as recited in the claim.

6. Claims 10-12, 18-20 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by Cooke Jr. et al. (USPN 6,574,629), which will be referred to herein as Cooke.

Art Unit: 2621

Referring to claim 10, Cooke discloses providing a case stack descriptive of a number of medical cases to be processed, each of the cases having assigned a predetermined number of medical images (col. 4 lines 42-44). A study as disclosed in Cooke is analogous to a case as recited in the claim in that it comprises a predetermined number of medical images (col. 8 lines 42-47). It follows that the list of studies disclosed in Cooke is analogous to the case stack recited in the claim.

Cooke further discloses a user definable file identifying the set of the images of each case to be sequentially rendered (col. 10 line 57 – col. 11 line 16). Form discloses storing study attributes on the database server in a header file. Form further discloses allowing the user to define these study attributes, namely the user identifies the set of the images of each study to be sequentially rendered (col. 32 lines 8-39). It follows that these user defined study attributes are stored in a file on the database server. Consequently, Cooke discloses a user definable file identifying the set of images of each case to be sequentially rendered.

Cooke further discloses prefetching of the set of images of a current case and prefetching of the set of images of a consecutive case into a cache from the image source (col. 19 lines 3-6). Form discloses prefetching a plurality of prior studies from the image source (col. 19 lines 55-56). It follows that a first prior study is prefetched and then a next prior study is prefetched. This situation corresponds to the prefetching of a current case and a consecutive case, respectively.

Referring to claim 11, Cooke further discloses that the user definable file comprises first data for indicating a required of a respective image of the set of images (col. 29 lines 5-55).

Referring to claim 12, Cooke further discloses that the user definable file comprises second data for specifying an image processing operation to be performed on the corresponding image of the set of images (col. 36 line 38 – col. 37 line 15).

Referring to claim 18, Cooke discloses an application program having at least one requestor program component for requesting of images (col. 13 lines 47-60).

Cooke further discloses a workflow file for specifying a sequence of images to be processed (col. 8 lines 39-48). The study disclosed in Cooke, is analogous to a workflow file as recited in the claim in that it comprises a sequence of images to be processed.

Cooke further discloses a cache memory coupled to the application program (see Figure 3).

Cooke further discloses a prefetcher program component being coupled to the cache memory and to the workflow file (col. 18 line 55 – col. 19 line 23).

Cooke further discloses a data source for providing images to the cache memory (col. 19 lines 6-8).

Cooke further discloses that the prefetcher program component enables prefetching of at least one subsequent image of the sequences of images to be processed as indicated by the workflow file (col. 18 line 55 – col. 19 line 23).

Referring to claim 19, Cooke further discloses a workflow file which comprises a case stack for identifying a number of medical cases to be processed (col. 4 lines 42-44). A study as disclosed in Cooke is analogous to a case

Art Unit: 2621

as recited in the claim. It follows that the list of studies disclosed in Cooke is analogous to the case stack as recited in the claim.

Cooke further discloses a user definable file identifying the set of the images of each case to be sequentially processed (col. 10 line 57 – col. 11 line 16). Form discloses storing study attributes on the database server in a header file. Form further discloses allowing the user to define these study attributes, namely the user identifies the set of the images of each study to be sequentially processed (col. 32 lines 8-39). It follows that these user defined study attributes are stored in a file on the database server. Consequently, Cooke discloses a user definable file identifying the set of images of each case to be sequentially processed.

Cooke further discloses prefetching of the set of images of a current case and prefetching of the set of images of a consecutive case into a cache from the image source (col. 19 lines 3-6). Form discloses prefetching a plurality of prior studies from the image source (col. 19 lines 55-56). It follows that a first prior study is prefetched and then a next prior study is prefetched. This situation corresponds to the prefetching of a current case and a consecutive case, respectively.

Referring to claim 20, Cooke further discloses that the cache memory has a cache program component for routing of a request of an image to an appropriate data source (col. 19 lines 11-15). The cache disclosed in Cooke has a cache program component in that it can route the request of an image to an appropriate data source.

Referring to claim 22, Cooke further discloses a scheduler coupled to a remote image server via a communication link, the remote image server containing a database of images and the scheduler being enabled to initialize a loading operation from the image server to a local file system of the images required for carrying out the workflow as indicated by the workflow file (col. 13 in conjunction with Figure 1). The PACS broker disclosed in Cooke is a scheduler as recited in the claim (col. 13 lines 9-11). It is coupled to a remote image server (web server 47) via a communication link. The remote image server contains a database of images (col. 13 lines 47-48) and the scheduler initializes a loading operation from the image server to a local file system (col. 13 lines 12-17) of the images required for carrying out the workflow as indicated by the workflow file (col. 13 lines 47-60). The studies disclosed in Cooke are analogous to a workflow file as recited in the claim.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2621

8. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cooke as applied to claim 12 above and further in view of Sidiropoulos et al. (USPN 6,127,66) and Keller et al. (US 2002/0102028). The arguments as to the relevance of Cooke as applied in paragraph 6 above are incorporated herein.

Referring to claim 13, Cooke further discloses scaling as a possible image processing operation (Cooke col. 36 line 61 – col. 37 line 4), but fails to expressly disclose contrast limited adaptive histogram equalization as an image processing operation. Sidiropoulos, however, discloses an operation (col. 2 line 65 – col. 3 line 10) which is analogous to the claimed CLAHE operation. It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Cooke's image prefetching method by adding CLAHE as one of the image processing operations as taught by Sidiropoulos. Such a modification would have allowed for a method of formatting a medical image in order to make it readable (Sidiropoulos col. 3 lines 6-9).

Further referring to claim 13, the combination of Cooke and Sidiropoulos discloses an image processing operation that can be selected from the group of scaling and CLAHE, but fails to expressly disclose wavelet enhancement as an additional image processing operation. Keller, however, discloses wavelet enhancement as an image processing operation (Keller paragraph [0080]). It would have been obvious to one reasonably skilled in the art at the time of the invention to modify the combination of Cooke and Sidiropoulos's image prefetching method by adding wavelet enhancement as an additional image processing operation as taught by Keller. Such a modification would have allowed for an image prefetching method which produced a more clear image (Keller paragraph [0081]).

9. Claims 14-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cooke as applied to claim 10 above, and further in view of Form (EP 0 766 183). The arguments as to the relevance of Cooke as applied in paragraph 6 above are incorporated herein.

Referring to claim 14, Cooke further discloses generating a header for each of the studies (cases) to be prefetched (Cooke col. 10 lines 60-63), but fails to expressly disclose generating an image header for each of the images in a case. Cooke also fails to expressly disclose that the header file comprises an image reference of the image to be prefetched, a priority, a lock count and a requestor of the image.

Form, however, discloses generating a description object (or image header) for each frame (or image) to be prefetched (Form page 7 lines 44-47). The semantic hints disclosed in Form refer to the individual images and consequently serve as an image reference. Form further discloses that the header comprises a reference of the prefetched image (Form page 7 lines 44-47). Form further discloses that the header comprises a priority (Form page 8 lines 47-50). Form further discloses that the header comprises a lock count (page 8 lines 14-18). The 'locked' tag disclosed in Form is analogous to the lock count as recited in the claim. Form further discloses that the header comprises a requestor of the image (page 7 lines 48-52). The system resources disclosed in Form qualify as a requestor as recited in the claim.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Cooke's image prefetching method by providing a header file for each of the images and have said header file comprise a reference of the prefetched image, a priority, a lock count and a requestor as taught by Form. Such a



Art Unit: 2621

modification would have allowed for a system in which the individual images of a medical case could be individually prefetched (Form page 7 lines 9-12).

With regard to claim 15, Form further discloses increasing the priority by a first number for each additional requestor (Form page 9 lines 39-47 in conjunction with Figure 8a-c). Figures 8a-c clearly disclose increasing the priority number by two for each additional requestor.

With regard to claim 16, Form further discloses reducing the priority by a second number for each release or cancellation of a requestor (Form page 9 lines 39-47 in conjunction with Figure 8a-c). Again, the Figures clearly show a reduction of the priority number for each release or cancellation of a requestor.

With regard to claim 17, Form further discloses incrementing the lock count with each additional requestor and decrementing the lock count when a request is released or cancelled (Form page 8 lines 1-29). Form discloses a tagging system which is analogous to incrementing a lock count in that with each additional requestor, the tag is moved one step closer to the 'locked' tag, and with each release or cancellation, the tag moves one step away from the 'locked' tag (see Figure 8). It is in this way that the increasing the tags as disclosed in Form is analogous to incrementing the lock count as recited in the claim. The 'locked' tag disclosed in Form is analogous to a maximum value for the lock count as recited in the claim.

10. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Cooke as applied to claim 18 above, and further in view of Form. The arguments as to the relevance of Cooke as applied in paragraph 6 above are incorporated herein.

Referring to claim 21, Cooke discloses generating header data, but fails to expressly disclose generating header data for each individual image requested from the cache memory. Cooke further discloses generating header data related to image format (Cooke col. 29 lines 4-6), but fails to expressly disclose generating header data related to priority and lock count.

Form, however, discloses generating a description object (or image header) for each frame (or image) requested from the cache memory (Form page 7 lines 44-47). Form further discloses that the header comprises a priority (Form page 8 lines 47-50). Form further discloses that the header comprises a lock count (page 8 lines 14-18). The 'locked' tag disclosed in Form is analogous to the lock count as recited in the claim.

It would have been obvious to one reasonably skilled in the art at the time of the invention to modify Cooke's image prefetching method by providing a header file for each of the images and have said header file comprise a reference of the prefetched image, a priority, a lock count and a requestor as taught by Form. Such a modification would have allowed for a system in which the individual images of a medical case could be individually prefetched (Form page 7 lines 9-12).

Art Unit: 2621

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (703) 305-6301. The examiner can normally be reached on 8:30am - 5:00pm M-F.

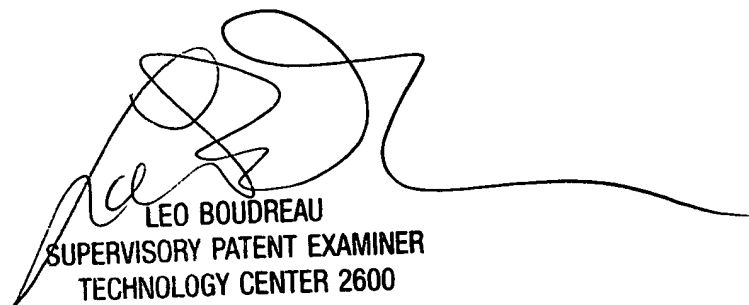
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on (703) 305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick Lynn Edwards

Art Unit 2621

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LEO BOUDREAU  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2600